

**The Knowledge Bank at The Ohio State University**  
**Ohio State Engineer**

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# *Closed*—the Road to Waste



INDUSTRY of the old school faced Waste as a necessary evil.

But now there is a *new school*, the modern, which employs new weapons to fight friction, maintain alignment, save power and preserve enduring machine life.

The coming generation of engineers and potential Captains of Industry are provided with the world's greatest weapon against Waste—Timken Bearings.

There is scarcely a single student of applied mechanics and economics who does not know Timken Bearings—and the exclusive combination of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken electric steel.

These graduates of the modern school are going out on the Highway of Life. They are going prepared to Close the Road to Waste with Timken Bearings, wherever wheels and shafts turn.

THE TIMKEN ROLLER BEARING CO.  
C A N T O N , O H I O

## **TIMKEN** *Tapered Roller* **BEARINGS**

APRIL, 1929



## The Sphere is Nature's Favorite Form

**I**T has only one dimension, is the only form that rolls in any direction with equal facility, is the most compact and strongest.

In the New Departure Ball Bearing man has capitalized on nature's infallible wisdom and has developed the most successful anti-friction device.

The New Departure steel ball evolves from special analysis wire (A), is "headed" into its first rough form (B), rough ground (C), finish ground (D), lapped (E), cleaned and polished (F) to a brilliant, smooth surface, to absolute sphericity and greater precision in dimension than any other commercial product.

These balls, between raceways of equal quality, finish and precision, become superior fighters of friction losses and preservers of mechanical precision in industrial service.

The New Departure Manufacturing Company,  
Bristol, Connecticut; Detroit, Chicago, San Francisco.

THE EVOLUTION  
OF THE  
STEEL BALL



A  
B  
C  
D  
E  
F



# NEW DEPARTURE BALL BEARINGS





## Locomotives

Briefly, the oil-electric locomotive is one in which an Ingersoll-Rand oil engine drives a generator, the latter furnishing power to a traction motor on each axle.

Because of its moderate fuel costs, quiet operation, and low maintenance expense, this type of locomotive has already been adopted by the country's leading railroads and industrial projects.

INGERSOLL-RAND CO.  
11 Broadway - New York City

A black and white photograph of an Ingersoll-Rand oil-electric locomotive, numbered E 101, pulling a train of empty freight cars. The locomotive is dark-colored with a prominent smokestack and various mechanical components on top. It is moving along a set of railroad tracks that curve through a flat, open landscape with bare trees in the background. The sky is overcast.

# Ingersoll-Rand



# ELECTRICITY—

*the modern prospector*

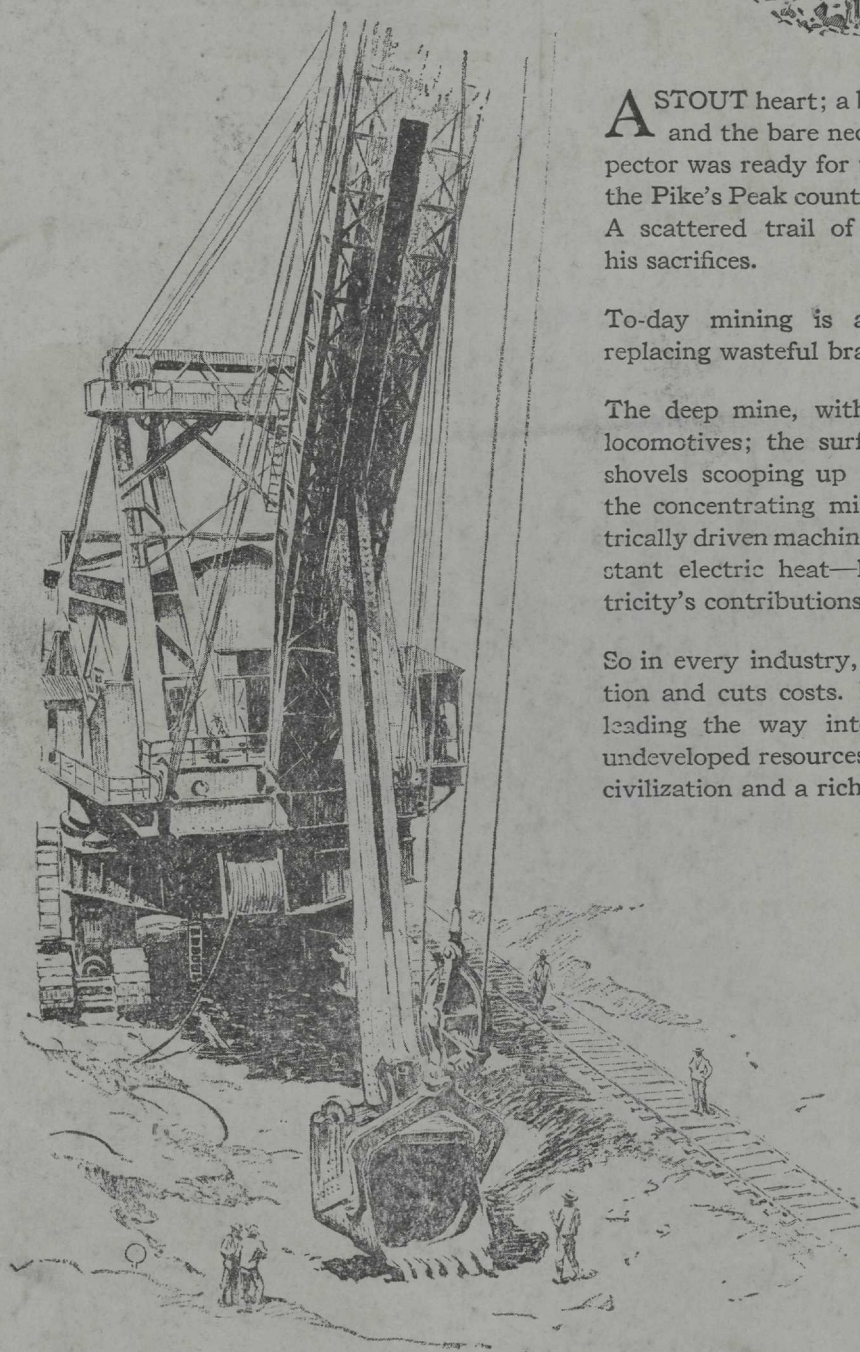


A STOUT heart; a burro laden with pick, shovel, and the bare necessities of life; and the prospector was ready for the gold rush—Sutter's Mill, the Pike's Peak country, Cripple Creek, Klondyke. A scattered trail of half-worked claims marked his sacrifices.

To-day mining is a business, with electricity replacing wasteful brawn in mine and mill.

The deep mine, with electric lights, hoists, and locomotives; the surface mine with huge electric shovels scooping up tons of ore in a single bite; the concentrating mill with its batteries of electrically driven machines; the steel mill with its constant electric heat—here are but a few of electricity's contributions to the mineral industries.

So in every industry, electricity increases production and cuts costs. It is the modern prospector, leading the way into wider fields and tapping undeveloped resources—that we may enjoy a finer civilization and a richer, fuller life.



You will find this monogram on powerful motors that drive heavy mining machinery and on tiny motors that drive sewing machines. Both in industry and in the home it is the mark of an organization that is dedicated to electrical progress.

95-658DH

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK